

Technical Assessment for Data and GIS Technician

INTRODUCTION

Welcome to your technical test! In this task, you will be using a combination of data cleaning, GIS analysis, and analytical reasoning to recommend where to allocate conservation funding. Below is an overview of the steps you should follow, and the expected deliverables for this test. Please read through the instructions carefully.

OBJECTIVE

The goal of this task is to identify regions in Africa where conservation funding could have the most impact, based on available data about biodiversity, funding levels, and biodiversity intactness. You will need to clean the provided biodiversity dataset, analyze the data, create maps in GIS, and make recommendations on funding allocation.

Note: This test contains both real and fabricated data, and you should thus base your findings on the results and not prior knowledge about African countries.

CONSERVATION FUNDING ALLOCATION PROJECT

Datasets

1. **biodiversity_data.xlsx**: An Excel file with multiple sheets that contain data on mammal and plant species for various African countries
2. **African_Conservation_Funding.csv**: A csv file with funding amounts for each African country
3. **bii4africa_all.tif**: A raster dataset containing a biodiversity intactness index
4. **african_countries_borders.zip**: A zipped folder containing shp file data on the borders of African countries

1. Data Cleaning (R or Python)

You will be provided with a biodiversity dataset that includes data on plant and mammal species per country. There may be data quality issues.

Tasks

- Clean the biodiversity dataset to address any issues.
- Conduct exploratory analysis on the data and provide some basic statistics and graphs.
- Create a country-level summary of the data that will be used in further analysis. This can be something like total number of species per country. Feel free to create your own index here that provides information on the biodiversity of each country.

Deliverables

- A markdown document (RMarkdown, Quarto or Jupyter) showing your R or Python code and graphs. Please document your thinking process.

2. Map Creation (GIS – QGIS, ArcGIS, R or Python)

Create three maps using a GIS tool of your choice. You should ensure that the data is projected correctly and that the maps are visually clear and well-designed. You are provided with the borders of African countries, but feel free to add other information to the map such as capitals or other landmarks (optional).

Tasks

- **Funding Map:** Visualize where conservation funding is allocated, based on the provided funding dataset.
- **Biodiversity Map:** Visualize biodiversity levels (using your summarised biodiversity dataset created in Section 1) across African countries.
- **Intactness Index Map:** Use the provided raster data (intactness index - bii4africa) to create a map showing biodiversity intactness across Africa.

Deliverables

- Three stylized maps showing funding, biodiversity, and intactness. Ensure the maps are appropriately sized for clear visibility when scaled to fit within a PowerPoint slide.
- A short report documenting any data processing steps. Feel free to add any comments or insights that document your thought process.

3. Analytical Analysis and Recommendation

After completing the maps, you should analyze the results to identify countries or regions where funding should be allocated. Your goal is to focus on areas where biodiversity is high but funding is low, and where biodiversity intactness is significant.

Tasks

- Use the maps and cleaned data to **recommend areas** for conservation funding.
- Justify your recommendations based on the following criteria:
 - Areas with **high biodiversity** but **low funding**.
 - Areas with **high biodiversity intactness** but **low funding**.
 - Any other criteria you think are relevant.

Deliverables

- A concise written **report** where you summarize your methodology, explain your reasoning, and provide funding recommendations.
- If your analysis was done using a GIS tool, please document your steps. If any analysis was done in R or Python, please provide a markdown document.

DELIVERABLES CHECKLIST

1. **Markdown file** showing data cleaning code and results.
2. **Three stylized maps** showing funding, biodiversity, and intactness. A short report with data processing steps.
3. **Analytical report** explaining your recommendations, including documentation of any data analysis steps.